



U.S. Pat. & Tm. App. Ser. No. 09/914,537

PATENT

**THE UNITED STATES PATENT AND TRADEMARK OFFICE**

**Appl. No.:** 09/914,537

**Examiner:** R. Sergent

**Applicants:** Bleys et al.

**Art Unit:** 1711

**Filed:** December 13, 2001

**Title:** Process For Preparing Moulded Polyurethane Material

**RULE 1.132 DECLARATION OF DR. GERHARD J. BLEYS**

I, GERHARD J. BLEYS, the undersigned, state the following:

1. I received the degree of Doctor of Philosophy in Chemistry from the University of Antwerp in Belgium

2. I have been employed by Huntsman Polyurethanes since October 1, 1987 and my title is Senior PU Scientist.

3. I am co-inventor of, and familiar with, the above-identified U.S. Patent Application Serial No. 09/914,537, which was filed on December 13, 2001 in the name of Bleys et al. and entitled "Process For Preparing Moulded Polyurethane Material."

4. The primary references Bleys ('226), Bleys et al. ('779) and Eling et al. ('483) cited by the Examiner in paragraph 3 of the Office Action mailed March 17, 2005 all relate to the use of high oxyethylene containing polyols in the preparation of flexible polyurethane foam.

5. The Mackey references ('409, '553, '528, hereinafter "Mackey") cited by the Examiner in paragraph 3 of the Office Action mailed March 17, 2005 all relate to an internal mold release composition and its incorporation into a reaction system used for producing molded articles via structural reaction injection molding techniques and containing (a) an organic polyisocyanate and (b) a compound containing a plurality of isocyanate-reactive groups. In these references, Mackey teaches "the internal mold release composition is used in an amount of from about 0.55 to about 18 and preferably about 2.6 to about 6 parts by weight based upon the weight of the reaction system." *U.S. Pat. No. 5,993,528* at col. 9, ls. 31-33.

6. To demonstrate the effect the Mackey mold release techniques have on a flexible polyurethane foam molding process according to the present invention, Example

1 of the above-identified patent application was repeated with the addition of a Mackey internal mold release composition to the reaction mixture. Thus, flexible polyurethane foam was produced from a reaction mixture containing a prepolymer, a polyol having a high oxyethylene content (77% by weight), an amine catalyst, water and an internal mold release composition as taught in Mackey.

7. The prepolymer used in producing the flexible polyurethane foam was prepared by reacting 70 parts by weight of a polyol (a random polyoxyethylene-polyoxypropylene polyol having a functionality of 3, a molecular weight of about 4000 and an oxyethylene content of about 77% by weight) with 30 parts by weight of a polyisocyanate (trade name Suprasec®).

8. The internal mold release composition used in producing the flexible polyurethane foam was prepared by mixing oleic acid with a fatty acid ester (trade names Kemester®5721 and Stepan®EGDS, an alternative to Kemester®EGDS having a melting point of 62°C which was chosen for use in this study based on the commercial unavailability of Kemester®EGDS). The amount of internal mold release composition used in the reaction mixture ranged from 2 to 10 parts by weight based upon the weight of the reaction mixture.

9. The prepolymer, polyol, amine catalyst, water and internal mold release composition were added to a container in the amounts set out below in Table A (as parts by weight), mixed to form a blend, then poured into an external mold release agent-treated metal mold and allowed to react:

**Table A**

<b>Ingredient</b>	<b>Ex. 1</b>	<b>Ex. 2</b>	<b>Ex. 3</b>	<b>Ex. 4</b>	<b>Ex. 5</b>	<b>Ex 6</b>	<b>Ex. 7</b>	<b>Ex. 8</b>
Prepolymer	86.7	86.7	86.7	86.7	86.7	86.7	86.7	86.7
Polyol	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
Amine Catalyst	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Water	1.38	1.38	1.38	1.38	1.38	1.38	1.38	1.38
Oleic Acid	2.5	1	5	1	5	1	5	1
Kemester® 5721	2.5	1						
Stepan® EGDS			5	5	2.5	2.5	1	1

The foams produced in Examples 1, 7 and 8 were severely collapsed and therefore inadequate for use. The foam produced in Example 2 demonstrated a long end-of-rise time and coarse cells which are properties not useful in flexible polyurethane foam. Finally, no foams were produced in Examples 3-6 due to the fact that the internal mold release composition was solid at room temperature.

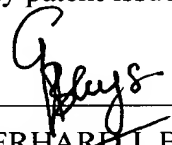
10. In comparison, as described in Example 1 of the above-identified patent application, 52 flexible polyurethane foams were produced in an external mold release agent-treated metal mold in the absence of an internal mold release composition. Each flexible polyurethane foam produced in Example 1 could be easily demolded without damage to the foam and had an apparent overall density of about 75 kg/m<sup>3</sup>.

11. The above clearly demonstrates that the mold release techniques of Mackey are not applicable to the molding processes of the present invention and primary references.

I declare that all statements made of my own knowledge are true, and that all statements made on information and belief are believed to be true. I made these statements with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and may jeopardize the validity of the application or any patent issued thereon.

5 Sept. 2005

DATE

  
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GERHARD J. BLEYS